be the footsteps of no other animal than man, and the engravings and photographs which accompany the paper leave no doubt on the mind of any one who sees them. The most remarkable circumstance characterising them is their great size. In one case there are thirteen footprints measuring 19 inches in length by 8 inches wide at the ball, and 6 inches at the heel. In another case the footprints are 21 inches long by 7 inches wide. There are others of a smaller size, possibly those of women. One track has fourteen footprints 18 inches long. The distance between the footprints constituting a "step" varies from 3 feet 3 inches to 2 feet 3 inches and 2 feet 8 inches, whilst the distance between the consecutive prints of the *same foot* constituting a "pace" varies from 6 feet 6 inches to 4 feet 6 inches. In none of the footprints of the deposit are the toes or claws of animals marked. As regards the beasts, this is probably due to the "slushy" state of the mud when the tracks were made. But in the case of the human footprints it is probably due to the use of some kind of shoe or mocassin.

I need not say that so far as the geological horizon is concerned this discovery does not carry the existence of man beyond the Quaternary Mammalia, with which it has long been pretty clear that he was associated in prehistoric times. Nevertheless it is, if confirmed, a highly remarkable discovery, especially as connected with the curious intimation so concisely made in the Jewish Scriptures, "And there were giants in those days." Hitherto, so far as I know, the remains of prehistoric man, so far as hitherto discovered, have not revealed anything abnormal in point of size. It is just possible that the slippery and yielding nature of the muddy lacustrine shore on which the tracks were made may have partly occasioned the apparent size. But the photographs and engravings exhibit them as very sharp and "clean cut." Professional Indian trackers have been employed to examine the tracks, and none of them seem to have the smallest doubt as to the footprints being human. ARGYLL

Cannes, April 14

P.S.—The paper was sent to me by my son, the Governor-General of Canada, a few weeks ago.

"The Ether and its Functions"

IN NATURE, vol. xxvii. pp. 304, 328, is a reprint of a lecture delivered by Dr. Oliver Lodge in December 28, 1882, at the London Institution, on "The Ether and its Functions." As this happens to be a subject to which I have devoted special attention, I would beg to offer a few remarks, also as my name is alluded to in the article.

The repudiation of the assumption of "action at a distance" in the first part of the lecture, coupled with the ingenious arguments by which its baselessness is exhibited, will no doubt be encouraging to all those who favour the advance of knowledge. But that portion of the lecture dealing with the constitution of the ether (and which assumes it to be non-molecular) is to my mind disappointing, as it looks like a step backwards to suppose the ether to be something essentially different from ordinary matter, while on all sides the simple opinion of the "unity of matter" has been making progress. I will quote the passage more especially relating to this point, viz. :—

"As far as we know, it (the ether) appears to be a perfectly homogeneous incompressible continuous body, incapable of being resolved into simple elements or atoms; it is in fact continuous, not molecular. There is no other body of which we can say this, and hence the properties of ether must be somewhat different from those of ordinary matter" (p. 305).

It will be admitted that clearness is a first desideratum in a theory. It appears difficult to see how an "*incompressible*" body is to transmit waves.[1] A remark of Maxwell's in his paper "On the Dynamical Theory of Gases" has some bearing on this point, viz. : "The properties of a body supposed to be a uniform plenum [*i.e.* not molecular] may be affirmed dogmatically, but cannot be explained mathematically" (*Phil. Trans.*, 1867, p. 49). Moreover, it seems hard to reconcile the fact that Sir W. Thomson's theory of the constitution of matter is apparently adopted or favoured in the lecture, and yet at the same time the molecular or atomic nature of the ether is repudiated. But is not Sir W. Thomson's theory of matter essentially an atomic theory? The incompressible fluid outside the vortex atoms cannot serve as the ether, or this seems an impossibility. Maxwell, for example, remarks in relation to this point, viz. : "The primitive fluid [*i.e.* the fluid exterior to the atoms] entirely eludes our perceptions"[1] (see "Encyc. Brit.," article "Atom," p. 45). The ether, however, does not entirely elude our perceptions, but is very distinctly felt in the beating of the waves of light upon the eye. It appears, therefore, that if the ether is to affect the senses at all it must consist of atoms or molecules (doubtless very much smaller than those of gross matter, a difference in *degree* but not a difference in *kind*). It may be noted in passing here how often notoriously has the error of mistaking a mere difference in *degree* for a difference in *kind or essence* been made in the history of science, and the correction of this error with the correlation and simplication of views attendant on its removal marks one of the chief stages of our progress. The theory of evolution abolished this error in regard to the animal world; its abolition in regard to the universe of matter is equally demanded. One satisfaction that Sir W. Thomson's theory of matter brings, consists perhaps in the fact that it does not overthrow our old conceptions as to the atomic constitution of matter so firmly built up by the able reasoners of the past, including Lucretius and Newton—and which has produced such great results for science. The Thomsonian view goes rather to confirm the atomic theory and to establish its truth by explaining in addition how an atom can be *elastic* and yet indestructible. Let us not deviate from the well-tried ground of the atomic constitution of matter, already won with so much labour, unless we are forced to do so, and let us work towards the great generalisation of the Unity of Matter and of Energy.

London, April S. Tolver Preston

P.S.—My views regarding the Matter of Space (the result of many years of thought and study) are contained in various scattered papers, references to the chief of which may be conveniently given here, viz. *Philosophical Magazine*, September and November, 1877, February, 1878; NATURE, January 15,[2] 1880; March 17, 1881; March 20, 1879; *Philosophical Magazine*, August, 1879, November, 1880; April and May, 1880, &c., &c. Also a little book, "Physics of the Ether" (E. and F. N. Spon), was published in 1875 as a first imperfect essay on the subject. The above papers include an atomic theory of the ether, capable of affording a simple and natural explanation of gravitation without the aid of "ultramundane corpuscules" [*i.e.* without the supply of any energy or matter at all from outside the bounds of the visible universe]. Dr. Lodge seems to admit that his premises cannot explain gravitation. But is not the elucidation of gravitation (which may be called the primary physical effect in the universe) one of the first requirements of any theory of the constitution of the Matter of Space? A more concise summary of my views (with additions and developments, the work of recent years) regarding the relations of the Matter of Space to ordinary matter and to the local fluctuating changes taking place in the universe, may be found in the forthcoming volume of the *Transactions of the Vienna Academy of Sciences*, to which they have been communicated by Prof. Ludwig Boltzmann of Graz.

"Krao"

SOME two months ago there appeared in NATURE (vol. xxvii. p. 245) certain statements about "Krao," the Siamese hairy child, which with your leave I would venture to correct. Krao's parents are both Siamese, not Laos; they are both still living in this city; neither of them presents any special peculiarity; they have other children still living, and also showing no special peculiarities; Krao, it is true, was not born in Bangkok, but in a village between this and the sea, her parents having a little time before her birth run away from their master, but coming back after the event. Siamese is of course Krao's native language;

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[1] For it seems apparent that an incompressible, non-molecular, "frictionless" liquid could not have wave-energy imparted to it at all, or a hot substance could not emit light or heat in such a medium. Moreover let us (in a spirit of fair argument) take a representation of one of the most commonplace effects in physics, say an explosion of gunpowder. Then the assumption of "action at a distance" being rejected, there is (admittedly) no more playful building of castles in the air out of "force," or no store of phantom energy to get the motion ("explosion") from. The motion therefore must inevitably come from the matter of space, or from a set of particles or atoms already in motion in space in their normal state. How is a non-molecular, *frictionless* liquid to lay hold (as it were) or act upon the molecules of gunpowder and put them in motion? Is not the objection conclusive though elementary?

[1] A clear and able exposition of the relation of Sir W. Thomson's theory of matter to the old-established atomic theory may be found in a paper on "The Atomic Theory of Lucretius," by an anonymous author in the *North British Review* for March, 1868.

[2] This paper includes a corpuscular theory of light consistent with the main principles of the undulatory theory—*not* therefore an *emission* theory.

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in her short journey up country with Mr. Bock, she, being an intelligent child, picked up a few words of Laos; the joints of her arms and fingers possess, it is true, according to European ideas great flexibility, but really they have it to no greater degree than those of ordinary Siamese; it is also true that she is able to use her toes, grasping things between the big toe and the next one in a way that is surprising and amusing to Europeans, but this is a faculty which all Siamese, being a barefooted people, possess to a greater or less degree; the child was looked upon here as even a greater natural curiosity than she is considered to be in England, her parents being in the habit of taking her about and showing her for a small reward, and the price they obtained for her (in native currency equal to 60*l*.) being twice that of an ordinary child of the same age. A strange mistake has been made about the child's name, "Krao" being merely the Siamese name for whiskers, a very natural nickname for the child to obtain. As far as I can ascertain from those who knew the child well, she is endowed with the average intelligence of Siamese children of her age and class, and beyond her abnormal hairiness presents no peculiarity.

To sum up, "she is," as you rightly remarked, "merely a *lusus naturæ*, or a sport, possessed rather of a pathological than an anthropological interest. I may add that I have carefully verified all the foregoing statements. A RESIDENT

Bangkok, Siam, March 3

[From information that has since reached me I am able fully to confirm the particulars here supplied by "A Resident."—A. H. K.]

Singing, Speaking, and Stammering

IN NATURE, vol. xxvii. p. 532, in the report of Dr. Stone's lecture on "Singing, Speaking, and Stammering," there appears a *Classification of Vowels*, which is described as an abstract of Mr. Melville Bell's scheme. I should like, however, to point out that the system which Mr. Bell has advocated for the last fifteen years is hardly represented in the *Classification* referred to. On turning to p. 63 of Mr. Bell's "Sounds and their Relations," which is a new exposition of "Visible Speech," it will be seen that the vowels *Ir* and *Ah* are not described as labio-lingual, and that the threefold arrangement of the vowels as lingual, labio-lingual, and labial is abandoned as incorrect. The lecturer does not appear to have mentioned the phonetic researches of Mr. A. J. Ellis and Mr. Henry Sweet. In many important points, however, they supplement the system of Mr. Bell, and their works cannot be overlooked in the scientific study either of etymology or pronunciation. The student of language can hardly do better than begin with Mr. Ellis's "Speech in Song," and Mr. Sweet's "Handbook of Phonetics." JAMES LECKY

5, Alexandra Road, Wimbledon, S.W., April 10

THE classification of vowels to which Mr. Lecky refers is taken from Mr. Melville Bell's "Principles of Elocution," which I obtained with much difficulty from a publisher in Salem, Massachusetts. It is dated 1878, and may, I suppose, be held to represent the author's system at that date. I am well acquainted with the other works named by Mr. Lecky. W. H. STONE

AS an illustrative instance of the peculiarities akin to stammering, referred to in Mr. Stone's lecture in last week's NATURE (p. 559), I may mention the case of an old Scotch lady whom I knew some years ago, and who was in the habit of interpolating at frequent intervals in her talk the wholly irrelevant words "This that here there ye ken." She herself evidently made use of the words with perfect unconsciousness of their irrelevancy; indeed I doubt whether, if challenged, she would have admitted using them at all. K.

A Curious Case of Ignition

"A CURIOUS case of ignition," quoted in NATURE, vol. xxvii. p. 509, reminds me of a similar circumstance that came under my own observation when serving in H.M. despatch vessel *Psyche*, 1862–66. We were moored "head and stern" in Port Napoleon, Marseilles, on a bright summer day. A strong smell of burning was traced to the saloon skylight. On bursting open the door of the saloon it was found that a scuttle glass (a plano-convex lens) through which the solar rays were admitted and focused on a rep curtain (which was smouldering) had been substituted for a broken one, but through an oversight had not been ground on the plane surface (as is usual). The case was reported by letter, and an order issued to insure all scuttle glasses used in men-of-war for the purpose being ground.

BERTRAM GWYNNE

Fibreballs

I HAVE seen balls of vegetable fibre, such as those referred to by Mr. G. H. Darwin in his letter of March 23 (NATURE, vol. xxvii. p. 507), in great abundance on the sea-beach at Cannes; there however they are not spherical like those described by Sir A. Musgrave, but cylindrical, two or three inches in length, finely and closely matted, and all wonderfully similar in appearance. In one place they had been collected and employed, if I remember rightly, to form a kind of wall. Some balls of a similar kind, but more nearly spherical and much coarser in texture, were found, on draining a pond, by Dr. Fitton, and sent by him to Sir J. Herschel, these were three or four inches across, and looked almost like small hedgehogs rolled up. J. H.

Benevolence in Animals

MR. GEO. J. ROMANES, in a lecture delivered in Manchester, March 12, 1879, on "Animal Intelligence," points out the following emotions which resemble human intelligence as occurring in animals below the human species, namely: fear, affection, passionateness, pugnacity, jealousy, sympathy, pride, reverence, emulation, shame, hate, curiosity, revenge, cruelty, emotion of the ludicrous, and emotion of the beautiful, and gives some remarkable instances in support of his statement. To this I can add benevolence on the part of our household cat, who was observed to take out some fish bones from the house to the garden, and, being followed, was seen to have placed them in front of a miserably thin and evidently hungry stranger cat, who was devouring them; not satisfied with that, our cat returned, procured a fresh supply, and repeated its charitable offer, which was apparently as gratefully accepted. This act of benevolence over, our cat returned to its customary dining-place, the scullery, and ate its own dinner off the remainder of the bones, no doubt with additional zest. OSWALD FITCH

Woodend, Fortis Green, N., April 12

The Zodiacal Light (?)

LAST Friday evening about 7 p.m. my attention was called to a peculiar appearance in the western sky. The sun had set not long before. No clouds were visible but one long thin streak, and there were the usual mists near the horizon. Above where the sun might be, a pillar of light faintly red in colour, with soft edges, but fairly well defined, rose vertically from near the horizon to the height of perhaps a few degrees. It did not look like an illuminated cloud nor like rays of light shot up through a cloud, nor like anything local; in fact I am told that it moved northwards with the sun. Was this the zodiacal light, or merely some sunset effect? It began to grow dim about 7.10 p.m., but was visible later than this. J. W. B.

New Kingswood School, Lansdown, Bath, April 10

Braces or Waistband?

THE writer has for the last thirty years dispensed with the use of either braces or a belt, having had his waistcoats made with short elastic straps attached inside and with holes to button on to the trousers like braces, one on each side and a third in front.

They answer as well as braces in conjunction with the ordinary waistband and buckle of the trousers, and the wearer is saved the feeling of strain across the shoulders or round the waist connected with the use of braces or a belt. G. H.

April 13

THE TEACHING OF ELEMENTARY MECHANICS[1]

AT the recent Annual Meeting of the Association for the Improvement of Geometrical Teaching held, as has already been noted in our columns, at University

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[1] Association for the Improvement of Geometrical Teaching, Ninth General Report, January, 1883.

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